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Collection of Run-0ff Water Samples		
Revision: #5	**Replaces: 4/17/02 version**	**Effective: 2/13/03**

1. Purpose and Scope: The Automatic Run-off Sampling Equipment (ARSE) is used to collect run-off water following a rainfall or irrigation over an area that has been treated with pesticide. The analysis of these samples provides an estimate of the potential for run-off water to carry pesticides away from a treatment site. The present SOP describes how to assemble and place an ARSE, and how to collect, stabilize and store run-off water samples. Any additional instructions on the selection of run-off sites, the number and placement of ARSEs at each site, collection of samples, and documentation of the monitoring process can be found in the Environmental Monitoring Plan (EMP) for the Program under study. The instructions in the EMP supersede instructions contained in this SOP.

2. Supplies Required (see the figure below): To request ARSE supplies contact the Laboratory Supplies Coordinator at the APHIS Analytical and Natural Products Chemistry Laboratory (ANPCL), Plant Protection and Quarantine, in Gulfport, MS at (228) 822-3106.

2.1 Environmental Monitoring Plan

2.2 environmental monitoring forms (APHIS Form 2060)

2.3 funnels (4" diameter) attached to threaded caps

2.4 500 mL water collection bottles with teflon lined cap

2.5 14" lengths of 4" o.d. PVC pipe

2.6 8" x 8" fine mesh screens (or larger)

2.7 tent pegs

2.8 plexiglass sheets (14" x 14")

2.9 bamboo poles and flagging tape

2.10 posthole digger

2.11 pea gravel

2.12 full bricks and ½ bricks (or rocks of various sizes)

2.13 clean, 1-gallon collapsible containers

2.14 rain gauge

2.15 baby wipes

2.16 field log book

2.17 pH indicator paper (4-8 pH range), pH adjustment and stabilization chemicals

2.18 ice chest with dry, wet or blue ice (obtain locally)

3. Assembly of ARSE

3.1 place ARSEs at each site as described in the EMP. ARSEs are placed in the bottom of drainage ditches, washes, dry creek beds, or any channel that shows signs of erosion due to run-off. Do not place ARSEs below the high water level of any nearby water body, otherwise the ARSEs might be totally submerged when you return to collect the sample.

3.2 use the post hole digger to dig a hole deep enough for the 14" length of PVC pipe to fit. Place the pipe into the hole so that it is flush with the ground level or slightly below. Make sure the pipe is firmly in place by backfilling outside the pipe with dirt. The pipe serves as a sleeve to hold the run-off collector.

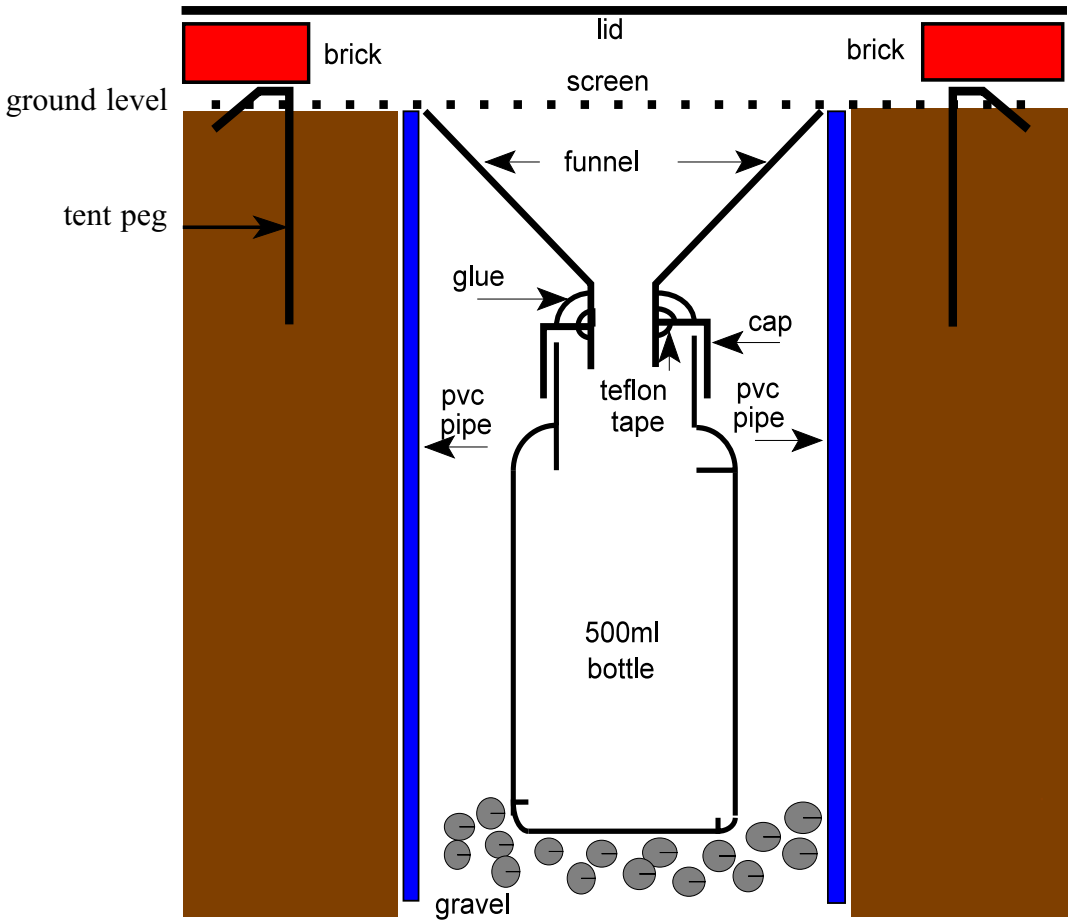
3.3 attach a clean funnel-cap assembly to a clean 500 mL glass bottle. Make sure the bond between the funnel and cap is strong by **gently** tapping the funnel on the side of your hand.

3.4 place collector assembly into the top of the PVC pipe. If the bottom of the collector is not supported, remove the run-off collector and add small pea gravel until the collector rests on the gravel. When the collector is placed correctly, the top of the funnel should be flush with the top of the PVC pipe (see the figure on the next page).

3.5 place the mesh screen over the funnel opening and fasten with tent pegs such that the screen is taut across the funnel mouth. The screen over the funnel will keep out debris, insects, amphibians, small mammals, etc.

3.6 place four ½ bricks (or large rocks, if that's all you have) at the corners of the 8" square screen. Place the plexiglass sheet on the ½ bricks. The plexiglass sheet serves as a protective cover for the ARSE, preventing dust, rain, or pesticide from directly entering the collector.

3.7 place a full brick (or large rock) on top of the plexiglass sheet to prevent the plexiglass sheet from being moved by a strong wind or heavy run-off.



3.8 repeat steps 3.2 to 3.7 until 6 ARSEs have been placed in the bottom of the channel.

3.9 place a bamboo pole with a flag tied to the top to mark the area where the ARSEs have been placed.

3.8 once the ARSEs have been positioned, place a rain gauge near enough to the treatment site such that any rain that falls can be accurately measured.

4. Run-off Water Sample Collection

4.1 within 12 hours of a significant rainfall (in which run-off would occur), check ARSEs for run-off.

4.2 before you leave the office, make sure you have an adequate supply of clean, unused run-off collectors (funnel-lid assemblies and 500 mL glass bottles) to replace ARSEs which contain run-off water.

4.3 check the rain gauge at the site. Record the day's date, measured rainfall, and estimated duration of rain, in your field log book.

4.4 locate the ARSEs, remove the plexiglass sheet, and carefully lift the collector assembly from the PVC pipe sleeve. Unscrew the funnel-lid assembly and cap the bottle with a teflon lined cap. Try not to disturb any sediment that might have settled in the bottom.

4.5 combine the contents of 6 ARSEs into one clean 1-gallon collapsible container. The contents of the 6 ARSEs will be treated as one composite sample. Try not to get any sediment from each ARSE into the gallon container as part of the composite run-off sample.

4.6 label the composite sample container using the indelible marker with a code that will allow the sample to be mated with its documentation.

5. Handling and Storage of the Run-off Sample

5.1 after a composite sample has been collected, refer to SOP EM-3, *Collection of Water Samples*, Section 7 for instructions on how to stabilize the sample, and

measure and adjust the pH.

5.2 while still in the field, place sample on ice until it can be stored in a freezer prior to shipment.

6. Equipment Replacement and Clean-up

6.1 empty the rain gauge and reset it.

6.2 clean the plexiglass covers with fresh baby wipes.

6.3 repeat steps 3.3 through 3.7 for each ARSE assembly.

6.4 take the used funnel-cap assemblies and 500 mL bottles back to the office and clean with tap water. Store until shipped back to ANPCL for decontamination and reconditioning.

7. Documentation

7.1 record observations in the field log book (see SOP EM-12, *Using a Field Log Book*). Include a sketch showing the path that run-off water follows between the treatment site and the sample collection sites where ARSEs are clustered, as well as the path the run-off water follows from the sampling site to any water bodies that receive the run-off. A topographical map or aerial photograph annotated with GPS coordinates and other required information should be provided as well as photographs or video of the run-off channel and the sample collection site. Be sure to record rain amount, estimated duration, time between the onset of the rain and the collection of run-off samples, land slope, soil type and a description of the type of vegetation growing between the treatment site and the sample collection site (see SOP EM-13, *Taking Measurements for the APHIS Form 2060*).

7.2 each composite run-off sample requires an APHIS Form 2060 for identification and analysis. Be sure to record in the Remarks block of the 2060 form that the sample is run-off water (or that it is an ARSE sample)

7.3 upon completing the APHIS Form 2060, retain the pink copy for your records and distribute the remaining copies as specified in the EMP or in the

instructions on the back of the Form 2060.

8. Packaging and Shipping:

8.1 Package and ship the frozen run-off water samples as described in SOP EM-17, *Packaging and Shipping of Samples*.

Direct any questions on placement, assembly or sample collection procedures to APHIS-PPQ, Environmental Monitoring Team at (301) 734-7175.